TETRA TECH

June 18, 2015

Ms. Susan Fisher
On-Scene Coordinator
U.S. Environmental Protection Agency – TLC
8600 NE Underground Drive, Pillar 253
Kansas City, Missouri 64161

Subject: Quality Assurance Project Plan for a Removal Assessment
PCE Chestnut Street Site, Atlantic, Iowa
U.S. EPA Region 7, START 4, Contract No. EP-S7-13-06, Task Order No. 0102
Task Monitor: Susan Fisher, EPA On-Scene Coordinator

Dear Ms. Fisher:

Tetra Tech, Inc. (Tetra Tech) is submitting the attached Quality Assurance Project Plan (QAPP) for the PCE Chestnut Street site in Atlantic, Iowa. If you have any questions or comments, please call me at (816) 412-1937.

Sincerely,

[redacted]

For Jeff Pritchard
START Project Manager

[redacted]

START Program Manager

Enclosures

cc [redacted] START Project Officer (cover letter only)

40496556

X9025.16.0102.000

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QUALITY ASSURANCE PROJECT PLAN

REMOVAL ASSESSMENT AT THE PCE CHESTNUT STREET SITE

ATLANTIC, IOWA

Superfund Technical Assessment and Response Team (START) 4 Contract
Contract No. EP-S7-13-06, Task Order 0102

Prepared For:

U.S. Environmental Protection Agency
Region 7
Superfund Division
11201 Renner Boulevard
Lenexa, Kansas 66219

June 18, 2015

Prepared By:

Tetra Tech, Inc.
415 Oak Street
Kansas City, Missouri 64106
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APPENDICES

Region 7 Superfund Program
Addendum to the Generic QAPP for Superfund Site Assessment and Targeted Brownfields Assessment Activities (October 2012)
for the PCE Chestnut Street Site

Project Information:

Site Name: PCE Chestnut Street Site			**City:** Atlantic **State:** Iowa
EPA Project Manager: Susan Fisher			**START Project Manager:** Jeff Pritchard
Approved By: [redacted]			
Title:	START Project Manager	Date: 6/17/15	**Prepared For:** EPA Region 7 Superfund Division
Approved By: [redacted]			
Title:	START Program Manager	Date: 6/17/15	
Approved By: [redacted]			**Prepared By:** [redacted]
Title:	START QA Manager	Date: 5/11/15	**Date:** June 2015
Approved By:			
Title:	EPA Project Manager	Date:	**Tetra Tech START Project Number:** X9025.16.0102.000
Approved By:			
Title:	EPA QA Manager	Date:	

1.0 Project Management:

1.1 Distribution List:

EPA—Region 7: Susan Fisher, On-Scene Coordinator; Diane Harris, Region 7 QA Manager

START: Jeff Pritchard, Project Manager; Kathy Homer, QA Manager

1.2 Project/Task Organization:

Susan Fisher, of the EPA Region 7 Superfund Division, will serve as the EPA Project Manager for the activities described in this QAPP. Jeff Pritchard of Tetra Tech, Inc. (Tetra Tech), will serve as the START Project Manager.

1.3 Problem Definition/Background:

Description: This site-specific Quality Assurance Project Plan form is prepared as an addendum to the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012) and contains site-specific data quality objectives for the sampling activities described herein.

☒ Description attached.

☐ Description in referenced report: _____ (Title) _____ (Date)

1.4 Project/Task Description:

☐ CERCLA PA ☐ CERCLA SI ☐ Brownfields Assessment
☐ Other (description attached) ☐ Pre-CERCLIS Site Screening ☒ Removal Assessment

Schedule: Field work is anticipated to occur in July 2015.

☐ Description in referenced report: _____ (Title) _____ (Date)

1.5 Quality Objectives and Criteria for Measurement Data:

Accuracy:	☒ Identified in attached table.
Precision:	☒ Identified in attached table.
Representativeness:	☒ Identified in attached table.
Completeness*:	☒ Identified in attached table.
Comparability:	☒ Identified in attached table.

Other Description:

*A completeness goal of 100 percent has been established for this project. However, if the completeness goal is not met, EPA may still be able to make site decisions based on any or all of the remaining validated data.

1.6 Special Training/Certification Requirements:

☒ OSHA 1910
☐ Special Equipment/Instrument Operator:
☐ Other (describe below):

1.7 Documentation and Records:

☒ Field Sheets ☒ Site Log ☐ Trip Report ☒ Site Maps ☐ Video
☒ Chain of Custody ☒ Health and Safety Plan ☒ Letter Report ☒ Photos

☒ Sample documentation will follow EPA Region 7 SOP 2420.05.

☒ Other: Analytical information will be handled according to procedures identified in Table 2.

Region 7 Superfund Program
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2.0 Measurement and Data Acquisition:

2.1 Sampling Process Design:

☐ Random Sampling ☐ Transect Sampling ☒ Biased/Judgmental Sampling ☐ Stratified Random Sampling
☐ Search Sampling ☐ Systematic Grid ☐ Systematic Random Sampling ☒ Definitive Sampling
☐ Screening w/o Definitive Confirmation ☐ Screening w/ Definitive Confirmation
☒ Sample Map Attached

The proposed sampling scheme for this project will incorporate a combination of biased and judgmental sampling with definitive laboratory analysis, in accordance with procedures included in the *Guidance for Performing Site Inspections under CERCLA*, Office of Solid Waste and Emergency Response (OSWER) Directive #9345.1-05, September 1992. Judgmental sampling is the subjective (biased) selection of sampling locations based on historical information, visual inspection, and the best professional judgment of the samplers. Sub-slab vapor samples will be analyzed on site by the EPA mobile laboratory. Sub-slab vapor samples may also be analyzed by the EPA Region 7 laboratory for verification. Indoor air samples will be analyzed by the EPA Region 7 laboratory. See Appendices A and B for additional site-specific information and maps. The proposed number of samples was determined by the EPA project manager and represents a reasonable attempt to meet the study objectives while staying within the budget constraints of a typical site investigation.

Sample Summary Location	Matrix	# of Samples*	Analysis
Inside commercial and residential buildings	Indoor air	25	VOCs
Outside commercial and residential buildings	Ambient air	1	VOCs
Sub-Slab at commercial and residential buildings	Sub-slab soil gas	Up to 30	VOCs (via EPA Region 7's mobile laboratory)
Sub-Slab at commercial and residential buildings	Sub-slab soil gas	3	VOCs

*NOTE: QC samples are not included with this total. See Table 1 for a complete sample summary.

2.2 Sample Methods Requirements:

Matrix	Sampling Method	EPA SOP(s)/Methods
Indoor Air	Evacuated stainless steel Summa canisters will be used to collect indoor air samples for analysis of VOCs. Calibrated flow regulators will allow the canisters to fill over a 24-hour period.	SOPs 2313.04 & 4231.1704
Ambient Air	An evacuated stainless steel Summa canister will be used to collect an ambient air sample for analysis for VOCs. A calibrated flow regulator will allow the canister to fill over a 24-hour period.	SOPs 2313.04 & 4231.1704
Sub-slab soil gas	Sub-slab vapor grab samples will be collected by connecting a 1-liter Tedlar bag to each sampling port and drawing air into the bag using a vacuum pump and evacuation chamber. Samples will be analyzed on site by EPA Region 7's mobile laboratory.	SOPs 2318.05, 2318.07, 2318.10 & SERAS SOP 2082
Sub-slab soil gas	Based on mobile laboratory results, EPA and START also may collect sub-slab vapor samples for verification analysis at the EPA Region 7 laboratory. Verification samples will be collected into evacuated stainless steel Summa canisters fitted with a 24-hour flow regulator.	SOPs 2318.07, 2318.10 & SERAS SOP 2082

2.3 Sample Handling and Custody Requirements:

☒ Samples will be packaged and preserved in accordance with procedures defined in Region 7 EPA SOP 2420.06.
☒ COC will be maintained as directed by Region 7 EPA SOP 2420.04.
☒ Samples will be accepted according to Region 7 EPA SOP 2420.01.

☐ Other (Describe):

2.4 Analytical Methods Requirements:

☒ Identified in attached table.
☒ Rationale: The requested analyses have been selected based on the historical information on the site and program experience with similar types of sites.

☐ Other (Describe):

2.5 Quality Control Requirements:

☐ Not Applicable
☒ Identified in attached table.
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
☒ Describe Field QC Samples: For this investigation, field QC samples will include one trip blank (air). The trip blank will be used to evaluate contamination introduced during transportation of the containers and samples. Evaluation of blank samples depends on the levels of contamination found in environmental samples to determine whether the environmental samples are representative. Analytical results from blank samples will be evaluated qualitatively by the EPA Project Manager and EPA contractor to determine a general indication of contamination potentially introduced in the field or laboratory. No field duplicate samples will be collected because determination of total method precision is not required for this project.

☐ Other (Describe):

2.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements:

☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).

☒ Other (Describe): Testing, inspection, and maintenance of field instruments (helium detector, Global Positioning System [GPS] units) will comply with manufacturers' recommendations. Testing, inspection, and maintenance of analytical instrumentation will comply with the previously referenced SOPs and manufacturers' recommendations.

2.7 Instrument Calibration and Frequency:

☐ Not Applicable
☒ Inspection/acceptance requirements accord with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
☒ Calibration of laboratory equipment will occur as described in the previously referenced SOPs and/or manufacturers' recommendations.

☒ Other (Describe): Calibration of field instruments (helium detector) will be performed in accordance with the manufacturers' recommendations.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables:

☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
☒ All sample containers will meet EPA criteria for cleaning procedures for low-level chemical analysis. Sample containers will have Level II certifications provided by the manufacturer in accordance with pre-cleaning criteria established by EPA in *Specifications and Guidelines for Obtaining Contaminant-Free Containers.*

☐ Other (Describe):

2.9 Data Acquisition Requirements:

☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
☒ Previous data/information pertaining to the site (including other analytical data, reports, photos, and maps, which are referenced in this QAPP) have been compiled by EPA and/or its contractor(s) from other sources. Some of that data have not been verified by EPA and/or its contractor(s); however, the information will not be used for decision-making purposes by EPA without verification by an independent professional qualified to verify such data and information.

☐ Other (Describe):

2.10 Data Management:

☒ All laboratory data acquired will be managed in accordance with Region 7 EPA SOP 2410.01.

☐ Other (Describe):

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for the PCE Chestnut Street Site

3.0 Assessment and Oversight:

3.1 Assessment and Response Actions:

☒ Peer Review ☒ Management Review ☐ Field Audit ☐ Lab Audit

☒ Assessment and response actions pertaining to analytical phases of the project are addressed in Region 7 EPA SOPs 2430.06 and 2430.12.

☐ Other (Describe):

3.1A Corrective Action:

☒ Corrective actions will be taken at the discretion of the EPA Project Manager whenever there appear to be problems that could adversely affect data quality and/or resulting decisions affecting future response actions pertaining to the site.

☐ Other (Describe):

3.2 Reports to Management:

☐ Audit Report ☐ Data Validation Report ☐ Project Status Report ☐ None Required

☒ A letter report describing the sampling techniques, locations, problems encountered (with resolutions to those problems), and interpretation of analytical results will be prepared by Tetra Tech START and submitted to the EPA.
☒ Reports will be prepared in accordance with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).

☐ Other (Describe):

4.0 Data Validation and Usability:

4.1 Data Review, Validation, and Verification Requirements:

☐ Identified in attached table.
☒ Data review and verification will accord with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated October 2012).
☒ Data review and verification will be performed by a qualified analyst and the laboratory's section manager as described in Region 7 EPA SOPs 2430.06, 2430.12, and 2410.10.

☐ Other (Describe):

4.2 Validation and Verification Methods:

☐ Identified in attached table.
☒ The data will be validated in accordance with Region 7 EPA SOPs 2430.06, 2430.12, and 2410 10.
☒ The EPA Project Manager will inspect the data to provide a final review. The EPA Project Manager will review the data, if applicable, from laboratory spikes and duplicates, laboratory blanks, and field QC samples to ensure the data are acceptable. The EPA Project Manager will also compare the sample descriptions with the field sheets for consistency, and will ensure appropriate documentation of any anomalies in the data.

☐ Other (Describe):

4.3 Reconciliation with User Requirements:

☐ Identified in attached table:
☒ If data quality indicators do not meet the project's requirements as outlined in this QAPP, the data may be discarded, and re-sampling or re-analysis of the subject samples may be required by the EPA Project Manager.

☐ Other (Describe):

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for the PCE Chestnut Street Site

Table 1: Sample Summary

Site Name: PCE Chestnut Street Site	**Location:** Atlantic, Iowa	
START Project Manager: Jeff Pritchard	**Activity/ASR #:** 6837	**Date:** June, 2015

No. of Samples	Matrix	Location	Purpose	Depth or other Descriptor	Requested Analysis	Sampling Method	Analytical Method/SOP
25	Indoor Air	Commercial and residential buildings within study area	To assess whether airborne site-related compounds are present inside buildings	NA	VOCs	EPA SOPs 2313.04 & 4231.1704	EPA SOP 3230.04
1	Ambient Air	Outside commercial and residential buildings within study area	To assess ambient air quality	NA	VOCs	EPA SOPs 2313.04 & 4231.1704	EPA SOP 3230.04
Up to 30	Sub-Slab Soil Gas	Commercial and residential buildings within study area	To assess whether site-related compounds are present below the buildings	NA	VOCs	EPA SOPs 2318.07, 2318.10 & SERAS SOP 2082	EPA SOP 2318.05
3	Sub-Slab Soil Gas	Commercial and residential buildings within study area	To assess whether site-related compounds are present below the buildings	NA	VOCs	EPA SOPs 2318.07, 2318.10 & SERAS SOP 2082	EPA SOP 3230.04
QC Samples							
1	Air	Trip Blank	To assess field/transportation-related contamination	NA	VOCs	NA	EPA SOP 3230.04

Region 7 Superfund Program Addendum to the Generic QAPP for Superfund Site Assessment and Targeted Brownfields Assessment Activities (October 2012) for the PCE Chestnut Street Site								
Table 2: Data Quality Objective Summary								
Site Name: PCE Chestnut Street Site				**Location:** Atlantic, Iowa				
START Project Manager: Jeff Pritchard				**Activity/ASR #:** 6837			**Date:** June 2015	
Analysis	**Analytical Method**	**Data Quality Measurements**					**Sample Handling Procedures**	**Data Management Procedures**
		Accuracy	**Precision**	**Representativeness**	**Completeness**	**Comparability**		
INDOOR AIR AND SOIL GAS								
VOCs	See Table 1	Per analytical method	Per analytical method	Judgmental sampling based on professional judgment of the sampling team	100%; no critical samples have been identified	Standardized procedures for sample collection and analysis will be used.	See Section 2 3 of QAPP form.	See Section 2 10 of QAPP form.

APPENDIX A

SITE-SPECIFIC INFORMATION REGARDING VAPOR INTRUSION SAMPLING AT THE PCE CHESTNUT STREET SITE

INTRODUCTION

The Tetra Tech, Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) has been tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division under contract number EP-S7-13-06 to assist with a Removal Assessment at the PCE Chestnut Street site in Atlantic, Iowa. The site was identified during vapor intrusion sampling at the adjacent PCE Former Dry Cleaners site during March 2015. Analytical data from indoor air and sub-slab vapor samples collected at three commercial buildings in the 300 block of Chestnut Street indicated elevated concentrations of tetrachloroethylene (PCE). The purpose of this Removal Assessment is to define the extent of PCE contamination in the surrounding area through more extensive vapor intrusion sampling. This investigation will proceed under authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA).

This Quality Assurance Project Plan (QAPP) identifies site-specific features and addresses elements of the sampling strategy and analytical methods proposed for the investigation.

SITE BACKGROUND INFORMATION

Information regarding the site's location, description, and relevant investigation history is discussed in this section.

Site Location/Description

Atlantic is a rural community in the northeastern portion of Cass County, Iowa, about 75 miles west of Des Moines, Iowa, and 45 miles northeast of Council Bluffs, Iowa. The PCE Chestnut Street site is in downtown Atlantic, Iowa (see Appendix B, Figure 1). Previous site activities have focused on three commercial buildings in the 300 block of Chestnut Street (see below). Planned Removal Assessment sampling will include commercial and residential buildings surrounding this area.

Previous Investigations

The PCE Chestnut Street site was identified during vapor intrusion sampling at the adjacent PCE Former Dry Cleaners site in March 2015. During this sampling event, Tetra Tech collected sub-slab vapor and indoor air samples at residences and commercial buildings primarily downgradient of the suspected contaminant source, the former Norge Dry Cleaning Village. Included in the sampling event were three commercial buildings in the 300 block of Chestnut Street, approximately 1.0 mile west-northwest of the

source area. Permanent flush-mount sub-slab gas wells (ports) were installed at two of the Chestnut Street buildings (312 and 315 Chestnut). One sub-slab soil gas sample was collected from each port (two total samples) and submitted to the EPA Region 7 laboratory for analysis of volatile organic compounds (VOC). Analytical results indicated PCE exceeding the EPA Regional Screening Level (RSL) for industrial air of 47 micrograms per cubic meter ($\mu g/m^3$). In addition, indoor air samples were collected from the two previously mentioned commercial buildings and from one additional commercial building at 319 Chestnut Street. The 319 Chestnut Street building, currently serving as a book store, is the former location of a dry cleaner and is a possible contaminant source for the site. PCE was detected in all three indoor air samples at concentrations ranging from 2.5 to 550 $\mu g/m^3$. PCE exceeded the EPA RSL for industrial air in indoor air samples collected at 315 and 319 Chestnut Street. Groundwater flow at the site is generally north; therefore, contamination from the former Norge Dry Cleaning Village (associated with the PCE Former Dry Cleaner site) is not suspected to influence PCE concentrations identified at commercial buildings along Chestnut Street.

SAMPLING STRATEGY AND METHODOLOGY

This activity will involve collection of indoor air and sub-slab soil gas samples to identify the extent of PCE contamination at the site. Sampling is tentatively scheduled to begin in July 2015 and will require approximately 1 week to complete. When applicable, the standard operating procedures (SOP) and chain-of-custody (COC) procedures referenced in this QAPP will be followed throughout the sampling activities to verify the integrity of the samples from time of collection until they are submitted for laboratory analysis. Disposal of investigation-derived wastes (IDW) and procedures for equipment and personal decontamination will be addressed in a site-specific health and safety plan prepared by Tetra Tech. Most IDW is expected to consist of disposable sampling supplies (tubing, gloves, and paper towels) that will be disposed of off site as uncontaminated solid waste. Descriptions of the sampling strategy and procedures follow.

Sub-Slab Port Installation

Proposed Removal Assessment sampling calls for installation of up to 30 sub-slab ports. The exact number of ports installed will depend on how many businesses and residences within the targeted area grant access to EPA. Exact port locations at each commercial or residential building will be identified by field personnel; however, in general, an attempt will be made to locate ports centrally (with respect to the buildings' footprint) in concrete slabs while avoiding buried utilities.

The concrete floor at each sub-slab sampling location will be penetrated by a hammer drill with a 1 1/2-inch-diameter concrete bit to a depth of about 1 1/2 inches into the slab. A 3/4-inch-diameter hole will then be drilled through the center of the larger inset, penetrating the slab. An approximately 4-inch-long, 0.25-inch-diameter stainless steel tube will be inserted through the drill hole into the sub-slab material. A 0.25-inch National Pipe Thread (NPT) fitting attached to the top of the probe with a removable plug will allow it to be sampled and then resealed. Quick-setting hydraulic cement will be used to seal the sampling probe in the drill hole. A cork surrounding the bottom portion of the probe will prevent grout from falling into the hole. The port will be flush with the floor and left in place until the project is complete. Construction and installation procedures will accord with the Scientific Engineering Response and Analytical Services (SERAS) SOP 2082 and EPA SOP 2318.07.

A helium test will be conducted to verify that the port is properly sealed after the sub-slab port is installed and the grout has hardened. A 1-liter Tedlar bag will be connected to the port by use of 0.25-inch-diameter perfluoroalkoxy (PFA) tubing. A plastic enclosure will be placed over the port and attached Tedlar bag, a helium tank will be attached to a fitting on the enclosure by use of plastic tubing, and the tank will be opened to allow helium to flow into the enclosure. Concurrently, sub-slab vapors will be purged from the sample line and sub-slab area, requiring operation of the sampling pump at a flow rate of 200 milliliters per minute (mL/min) until the Tedlar bag is full. The Tedlar bag will then be connected to a helium detector. If a helium reading greater than 5 percent above background is observed, corrective measures will be taken to address leaks in the system. If helium readings less than 5 percent above background cannot be achieved, the port must be abandoned and a new hole drilled. At the end of the purge time, if no helium readings greater than 5 percent above background have been observed, the system will be considered free of leaks and ready for sampling. The helium leak check results will be recorded in the field logbook. The helium leak check procedures will accord with EPA SOP 2318.07.

Sub-Slab Soil Gas Sampling

Sub-slab soil gas samples will be collected through previously installed ports at up to 30 locations. Before samples are collected, a leak check will be completed at each port location as previously described. After the leak check is complete, a sub-slab vapor grab sample will be collected by connecting a 1-liter Tedlar bag to each sampling port and drawing air into the bag using a vacuum pump. Samples will be analyzed on-site for VOCs by the EPA Region 7's mobile laboratory via SOP 2318.05. Based on mobile laboratory results, EPA and START also may collect sub-slab vapor samples for verification analysis at the EPA Region 7 laboratory (an estimated three verification samples for this sampling activity).

About 6 inches of disposable, 0.25-inch-diameter PFA tubing will be used to connect the top of the port to an evacuated Summa canister to collect sub-slab vapor samples for verification analysis. Before the sample is collected, the tubing will be connected to a small vacuum pump to purge ambient air from the tubing, port and immediate sub-slab area.

Verification sub-slab vapor samples will be collected over 24-hour periods via flow regulators attached to the Summa canisters. Pertinent data — including analyses to be performed, exact sample locations, canister numbers, start/stop times and vacuum readings — will be recorded on field sheets for each sample. Sub-slab sampling will be in accordance with the procedures in EPA Region 7 SOPs 2318.07 and 2318.10. Verification sub-slab vapor samples will be analyzed for VOCs at the EPA Region 7 laboratory according to EPA Region 7 SOP 3230.04.

Indoor Air Sampling

Proposed Removal Assessment sampling calls for collection of 25 indoor air samples. Mobile laboratory results from analysis of sub-slab vapor samples will be used to evaluate the necessity of indoor air sampling at commercial and residential buildings. Evacuated Summa canisters fitted with 24-hour passive flow regulators will be located within living areas (if identified) or active business spaces at locations selected for indoor air sampling. Indoor air sampling will accord with EPA Region 7 SOP 4231.1704 (Environmental Response Team SOP #1704) – Summa Canister Sampling. In addition to indoor air samples, one sample will be collected from an outdoor location (ambient air). The ambient air sample location will be identified by field personnel while on site. The ambient air sample will also be collected over a 24-hour period. Pertinent data — including analyses to be performed, exact sample locations, canister numbers, start/stop times and vacuum readings — will be recorded on field sheets for each sample. Indoor air samples will be analyzed for VOCs at the EPA Region 7 laboratory according to EPA Region 7 SOP 3230.04.

Before indoor air sampling, the structures will be inspected for stored chemicals and fuels that may contribute VOCs to indoor air. These items will be either sealed in plastic bags or removed from the premises several days before sampling to minimize introduction of VOCs from other sources (other than from a subsurface source).

Quality Control Samples

Field quality control (QC) samples for this investigation will include one trip blank (air). The trip blank sample will be analyzed for VOCs at the EPA Region 7 laboratory according to EPA Region 7 SOP

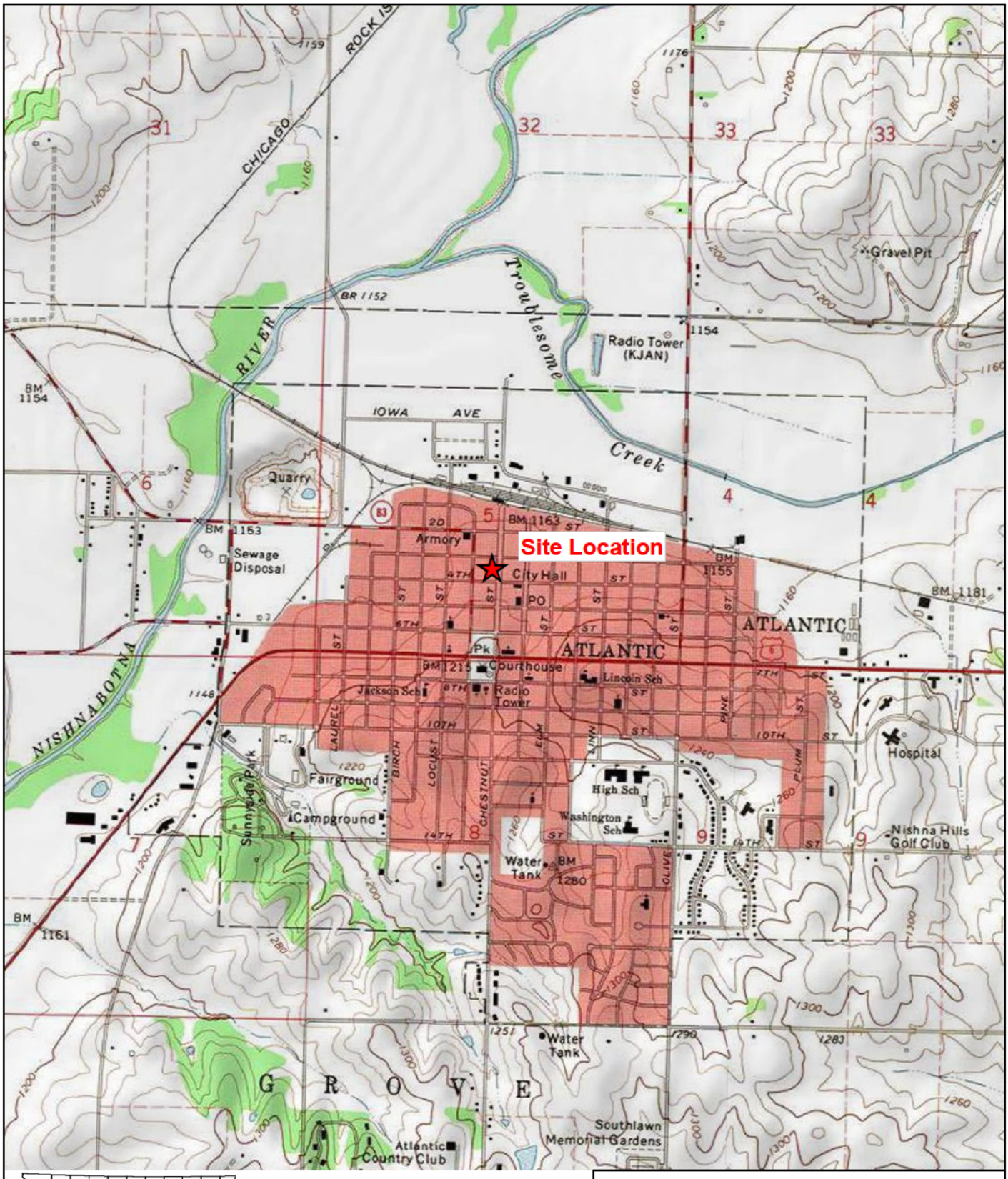
3230.04. The trip blank will be used to evaluate contamination introduced during transportation of the containers and samples. No field duplicates will be collected because evaluation for total method precision will not be necessary for this project.

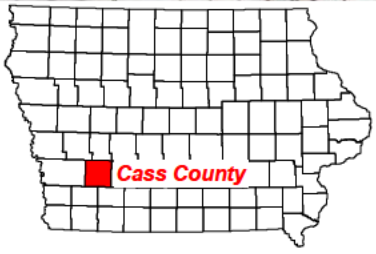
ANALYTICAL METHODS

Sub-slab vapor samples will be analyzed for VOCs on site by EPA Region 7's mobile laboratory via SOP 2318.05. Field personnel may choose to collect sub-slab verification samples to be analyzed by the EPA Region 7 laboratory. These verification samples, along with indoor air samples, will be analyzed for VOCs by the EPA Region 7 laboratory according to EPA Region 7 SOP 3230.04.

APPENDIX B

FIGURES





N

0 1,000 2,000

Feet

Source: USGS Atlantic, Iowa 7.5 Minute Topo Quad, 1991
USGS Wiota, Iowa 7 5 Minute Topo Quad, 1971

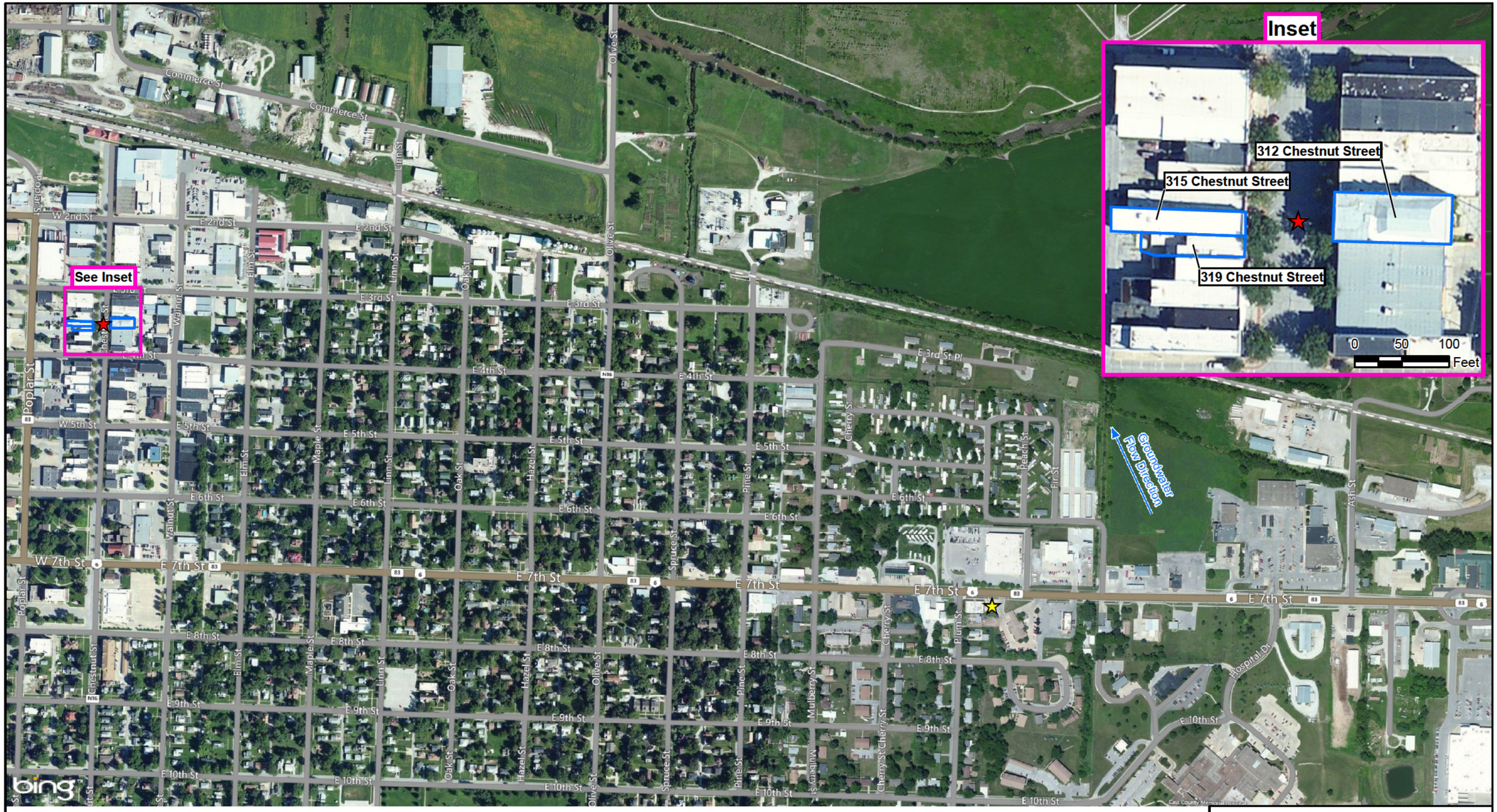
PCE Chestnut Street Site
Atlantic, Iowa

Figure 1
Site Location Map

TETRA TECH

Date 6/15/2015 [redacted] Project No X9025.16.0102.000

X:\G\902501\02\Projects\mxd\Figure1.mxd



Legend

- Former location of Norge Dry Cleaning Village
- PCE Chestnut Street Site
- Previously sampled property

Source: ESRI, ArcGIS Online, Bing Maps Hybrid, 2015

N

0 250 500

Feet

PCE Chestnut Street Site
Atlantic, Iowa

Figure 2
Site Layout Map

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Date 6/18/2015

Project No X9025.16.0102.000

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